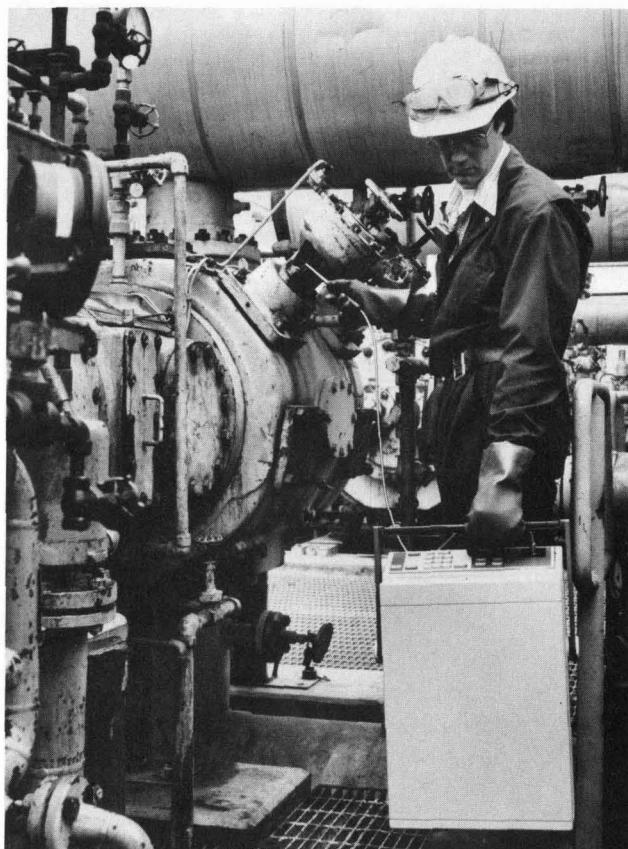




GAS ANALYZER

One of the instruments planned for NASA's Viking Landers, two spacecraft that investigated the possibility of life on Mars, was a miniature gas chromatograph (GC), a system that separates a gaseous mixture into its components, then measures the concentration of each gas in the mixture. Widely used by industry and research organizations, the GC is usually a bulky device. For the Viking Landers, the GC had to be highly sophisticated, capable of detecting respiratory gases given off by microbes if they existed, but it also had to be extremely small and lightweight to fit in a spacecraft packed with instrumentation for life detection, soil analysis and atmosphere sampling.

More than a decade ago, Ames Research Center conducted the initial research and designed such a system. Additionally, NASA contracted with Stanford University for development of flight hardware for the Viking Landers. The device was not developed in time for the Viking missions, but the technology interested the National Institute for Occupational Safety and Health (NIOSH), Cincinnati, Ohio. Looking for a portable device for detecting toxic gas leaks in industrial environments, NIOSH provided funds for further development of the Ames/Stanford GC. Subsequently, three researchers who had worked on



the GC project left Stanford to form a new company—Microsensor Technology Inc., Fremont, California—to produce a portable gas analyzer for the commercial market. Introduced in 1982, it is known as the Michromonitor 500.

Shown in the accompanying photos, the Michromonitor 500 is a battery-powered system designed for field use—in plants, on towers or drilling rigs, down mine shafts—by unskilled operators with little or no technical training. The system consists of a sensing wand connected to a computerized analyzer that measures gas concentrations as small as one part per million in most cases, 10 parts per million for some gases. A pushbutton keyboard allows selection of up to 10 gases for analysis at a time; the system is programmed for a total of 100 gases. It takes just 30 seconds to complete a measurement cycle and, at the touch of a button, the results of each analysis—identity of gas, its concentration and the time of analysis—appear in a display window. The Michromonitor 500 has a wide range of applications, such as industrial safety, monitoring work areas for gas leaks or volatile chemical spills; analyzing industrial process gases; monitoring stack gases for compliance with pollution laws; identifying gases produced during energy explorations; in police work, breath alcohol analysis and arson investigations; and, in medicine, respiratory and anesthetic analysis.